Chapter 4

Water Quality

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INTRODUCTION

Water quality conditions in the American River basin and downstream areas of the Delta depend on the timing and quantities of watershed runoff, regulation of reservoir releases, discharges of municipal and industrial wastewater and stormwater from urbanized areas, and reduction in flows as a result of water deliveries for municipal uses. These factors influencing river water quality conditions and the conditions that could be affected by the proposed project alternatives were fully described in the 1997 DEIR/EIS.

This chapter presents revised water quality modeling results for evaluating the effects of the new project alternatives on water quality. As described in Chapter 3, "Hydrology and Water Supply," hydrologic simulation of the proposed project alternatives was performed with Reclamation's PROSIM 99 model, which has been updated since publication of the 1997 DEIR/EIS.

AFFECTED ENVIRONMENT

Regulatory Framework

The beneficial uses and water quality objectives for waters within the area potentially affected by the proposed project operations are established by the Central Valley Regional Water Quality Control Board (CVRWQCB) and were described in the 1997 DEIR/EIS. Water quality objectives are designed to protect beneficial uses such as agricultural, municipal, and industrial supply; fish and wildlife; recreation; navigation; and power generation. The CVRWQCB sets numerical and narrative water quality objectives for several physical and chemical parameters.

Beneficial uses are protected primarily through programs for municipal and industrial wastewater and stormwater discharges associated with the CVRWQCB and the National Pollutant Discharge Elimination System (NPDES) permitting process pursuant to the federal Clean Water Act. General NPDES stormwater permits are also required for certain industrial activities, construction activities, dewatering activities, pump testing, and coffer dam construction. NPDES permits require preparation of a Storm Water Pollution Prevention Plan (SWPPP) that identifies Best Management Practices (BMPs) to be employed to prevent discharges of pollutants such as eroded soil, petroleum-based fuels and oils, and other hazardous materials that could contaminate nearby water resources and exceed established water quality objectives. Activities that are performed under U.S. Army Corps of Engineers (Corps) jurisdiction for Section 404 of the Clean Water Act require Section 401 Water Quality Certification from the CVRWQCB, and stream crossings are permitted by CDFG Streambed Alteration Agreements. Local grading and erosion control ordinances may also apply to components of the project that involve substantial soil disturbance.

Sacramento–San Joaquin River Delta

This section is focused on updating the analysis of the most significant water quality variables that could be affected by the project alternatives. As described in the 1997 DEIR/EIS, the constituents of concern in the Delta include potentially harmful disinfection byproducts, such as the trihalomethane compounds, which can be formed during certain disinfection treatment processes used for drinking water. High-salinity water from Suisun Bay intrudes into the Delta during periods of low Delta outflow and can adversely affect agricultural and municipal uses. Salinity standards at the Contra Costa Canal intake (municipal objective) and at Jersey Point (agricultural objective) on the San Joaquin River are often controlling variables that determine required releases by upstream State Water

Project (SWP) and CVP reservoirs to maintain adequate Delta outflow.

ENVIRONMENTAL CONSEQUENCES

Methods and Assumptions

Impacts of Delta salinity on water supplies were calculated with monthly average Delta outflow for a simulated 1922–1991 period of record from PROSIM 99 modeling completed for the hydrology analysis. The methodology calculates the effective outflow (i.e., equivalent steady-state outflow) that controls salinity intrusion. An effective outflow was calculated to estimate electrical conductivity (EC) and chloride concentrations at Rock Slough, which is the location of the Contra Costa Canal intake structure. Estimated Rock Slough chloride levels are also representative of chloride in Old River, which conveys most of the water exported from the Banks and Tracy pumping plants. Historical Rock Slough chloride values are a constant fraction (i.e., 0.11) of the Jersey Point EC value, and Jersey Point EC is a function of effective outflow.

As compared to data presented in the 1997 DEIR/EIS, the data indicate that, with a higher range of chloride concentration conditions in Rock Slough (i.e., 150 to 250 milligrams per liter [mg/L]), the current PROSIM 99 values are generally higher than comparable data points from the 1997 DEIR/EIS. The average and standard deviation of the difference between the chloride concentrations simulated in the two model runs help to describe the magnitude of observed differences. The mean annual difference and associated standard deviation between existing conditions and Alternative 1, "No Action," values is 0.4 ± 7.8 mg/L chloride.

As described in Chapter 3, "Hydrology and Water Supply," the amount of available water in the current PROSIM 99 version is generally less than in the previous version, particularly during dry year types. Reductions in flows during summer months in particular can reduce Delta outflow, which is the key factor affecting salinity conditions in the western Delta. Whenever the effective outflow increases, salinity is expected to be reduced; whenever the effective outflow is reduced, salinity is expected to increase. Because of its location closer to Suisun Bay than the other major exporters, Rock Slough was assumed to represent worst-case conditions for the purposes of impact analysis.

Significance Criteria

The primary water quality issues of the proposed project include surface soil and instream disturbances from construction of intake structures, pumping plants, and pipelines; changes to the water quality in terminal reservoirs that may receive water from the American River; and changes in ambient water quality variables in the Delta as a result of reduced Delta inflow. The water quality impact significance criteria remain unchanged from the 1997 DEIR/EIS. An alternative was considered to have a significant impact if construction activities would degrade water quality or violate CVRWQCB water quality objectives for turbidity; EBMUD delivery water would substantially increase the frequency or duration of nuisance taste and odor in EBMUD terminal reservoirs; or reductions in Delta outflow would result in an increase in average annual chloride levels at delivery points within the Delta by more than 3 mg/L or an increase of more than 30 mg/L in 10 percent of the months that were evaluated. These criteria are based on the most restrictive municipal water quality objective for monthly average chloride at the Contra Costa Canal of 150 mg/L.

Impacts Found to Be Less Than Significant

Changes to conditions under the supplemental alternatives were compared to No Action.

Alternative 4: EBMUD-Only Lower American River Delivery, Scenarios 1 and 2

Impact: Discharge of Pollutants in Stormwater from Construction of Project Facilities. Construction activity for the proposed intake structure and pipeline alignments would result in nearly identical site disturbance, vegetation removal, grading,

excavation, stream and river crossings, and other soil disturbances as described for Alternative 3, "Joint Water Supply," in the 1997 DEIR/EIS, because the same basic facilities would be constructed.

Turbidity downstream of the intake structure construction site could increase on a daily intermittent and temporary basis. The turbidity generated in the river would affect a relatively small area, because the work would be done in dewatered areas within sheet piling. The CVRWQCB would likely require water quality monitoring during construction as part of the Section 401 permitting process to maintain acceptable turbidity levels.

EBMUD and its contractors would obtain all required local permits, clearances, and NPDES permits from the CVRWQCB and implement appropriate BMPs to protect water resources from contamination. This impact is less than significant. No mitigation is required.

Impact: Increased Frequency or Duration of Taste and Odor Events in EBMUD Terminal Reservoirs. Transport of American River water that may have a higher content of biostimulatory nutrients could increase the frequency or duration of taste and odor events in EBMUD terminal reservoirs. As described in the 1997 DEIR/EIS, methods are available for the control of algae and other organisms that produce the compounds that cause taste and odor problems in drinking water supplies. Because effective and environmentally safe methods of control are available for algae and taste and odor control, this impact is less than significant. No mitigation is required.

Impact: Impairment of Delta Export Water Quality. Modeling was not specifically conducted to simulate the effects of Alternative 4, Scenarios 1 and 2, on Delta export water quality. However, the effects of larger EBMUD deliveries under Alternative 2 were estimated using the PROSIM 99 model results. Reduction of annual flows in the lower American River as a result of project deliveries from the basin would reduce Delta outflow slightly. Figure 4-1 shows Rock Slough chloride concentrations and changes that would occur under Alternative 2. The mean annual difference and associated standard deviation between Alternative 1, "No Action," and Alternative 2, "Folsom South Canal Connection," based on the PROSIM 99 modeling were -0.01 ± 1.4 mg/L chloride. Because the predicted mean annual change is small compared to the significance criteria, and the monthly differences never exceed 30 mg/L chloride, and given that changes resulting from Alternative 4 would be substantially less than those under Alternative 2, this impact is less than significant. No mitigation is required.

Alternative 5: Sacramento River Delivery
Alternative 6: Freeport East Delivery
Alternative 7: Freeport South Delivery
Alternative 8: Bixler Delivery

Impact: Discharge of Pollutants in Stormwater from Construction of Project Facilities. The duration and extent of construction activity for delivery intake structures and ground disturbances associated with the pipeline alignments would be similar to those under Alternative 4. Because EBMUD and its contractors would obtain all required permits and implement appropriate BMPs for water pollution control, this impact is less than significant. No mitigation is required.

Impact: Increased Frequency or Duration of Taste and Odor Events in EBMUD Terminal Reservoirs. Transport of water from the Sacramento River intake structures for Alternatives 5, 6, 7, and 8 would generally have a higher content of biostimulatory nutrients than American River water and therefore could increase the frequency or duration of taste and odor events in EBMUD terminal reservoirs. Water quality near the Bixler intake structure may have higher nutrient and salinity levels than the Sacramento or American River intake locations. Salinity is not readily controllable in source water and could cause slight increases in salinity in the terminal reservoirs. As already indicated, methods are available for the control of algae and other organisms that produce compounds that cause taste and odor problems in drinking water supplies. In addition, the proposed in-line water treatment plants would reduce the potential impacts associated with suspended solids and nutrients in the source

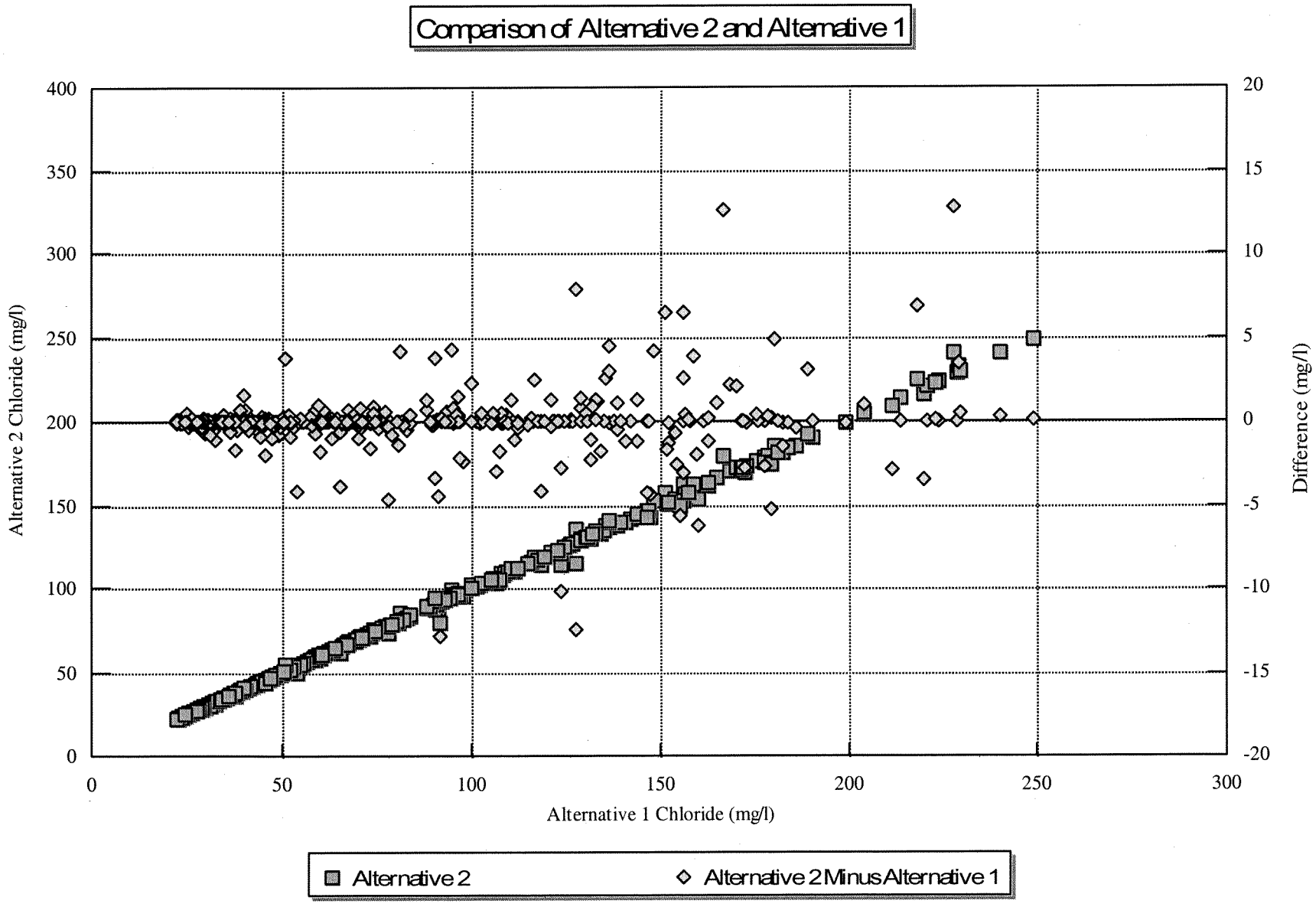

Figure 4-1.
Rock Slough Chloride: Alternative 2 and Alternative 1

water. This impact is less than significant. No mitigation is required.

Impact: Impairment of Delta Export Water Quality. Reduction of annual flows in the lower Sacramento River as a result of project deliveries from the basin could reduce Delta outflow. The Sacramento River and Bixler delivery intake alternatives were simulated with a single PROSIM 99 model run as described in Chapter 3. The simulated Delta outflow values were then used to estimate potential changes in chloride concentrations in Rock Slough.

Figure 4-2 shows Rock Slough chloride concentrations and changes that would occur under these supplemental alternatives compared to Alternative 1, "No Action." The results indicate very little difference in chloride levels as a result of the project deliveries. The mean annual difference and associated standard deviation between these supplemental alternatives and Alternative 1 values are 0.0 ± 1.2 mg/L chloride. Because of the small predicted change, this impact is less than significant. No mitigation is required.

Significant Impacts and Mitigation

Alternative 8: Bixler Delivery

Impact: Impairment of Suisun Bay Water Quality Related to Brine Disposal. One of the treatment options under consideration would involve a reverse osmosis process, which would result in production of highly saline brine that would require disposal at an appropriate location. Under this alternative, a new brine pipeline would be constructed to convey brine to a suitable discharge location near Port Chicago, where the salinity of the receiving waters would be approximately equal to that of the brine discharge. While this discharge would not necessarily result in new constituent loadings to the bay, and although the discharge would require a permit from the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) which regulates such activities, there is a slight potential that the discharge could affect aquatic resources and water quality in the area immediately surrounding the discharge. This potential impact is considered significant. Implementation of Mitigation Measure 4-1 would reduce this impact to a less-than-significant level.

Mitigation Measure 4-1: Conduct Further Investigations and Minimize Impacts Associated with Brine Discharge. Before completing design activities and initiating project construction, EBMUD would be required to undertake additional studies in order to obtain a discharge permit from the SFBRWQCB. This agency is responsible for ensuring that such discharges do not violate water quality standards and that the beneficial uses of the state's waters are protected. If any substantial effects resulted, additional protective measures could be required. Such measures could include blending the brine prior to discharge or relocating the discharge. EBMUD would comply with all permit terms and conditions.

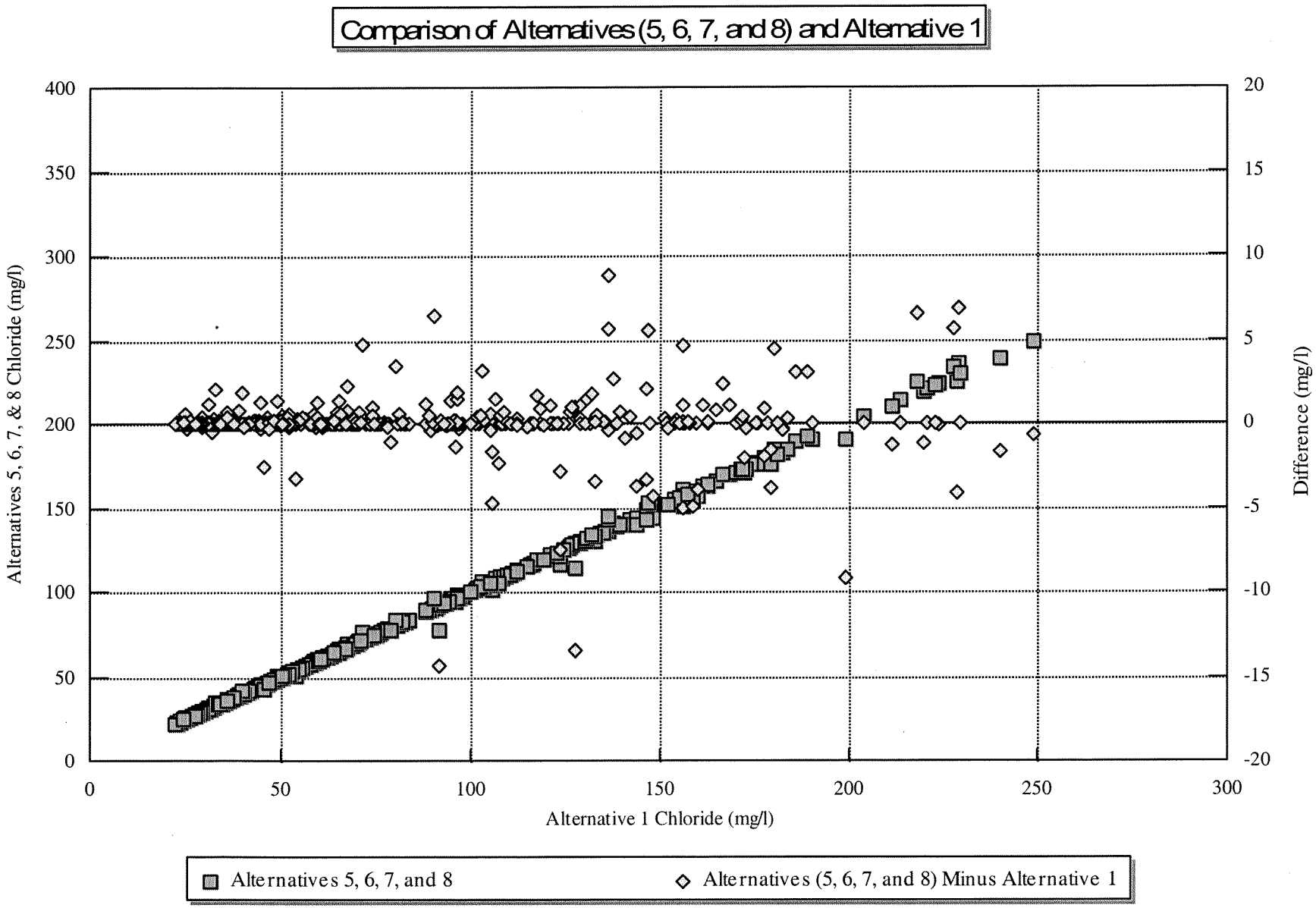

Figure 4-2.
Rock Slough Chloride: Alternatives 5, 6, 7, and 8 and Alternative 1